

SELF-MANAGEMENT PROCEDURES IN A
FIRST-GRADE CLASSROOM

A Thesis
Presented to
The School of Graduate Studies
Drake University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
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August, 1972

1972
M123

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CHAPTER I

INTRODUCTION

The self-control dilemma, that is, the same person being both the object and the subject of the action, has undergone considerable investigation recently and apparently is no longer considered an unmanageable area. Self-control is treated as simply behavior and therefore subject to the same principles that govern other behavior. Skinner (1953) writes "when a man controls himself, chooses a course of action, thinks out a solution to a problem, or strives toward an increase in self-knowledge, he is behaving. He controls himself precisely as he would control the behavior of anyone else--through the manipulation of variables of which behavior is a function (p. 228)."

If self-control procedures are learned in the same manner as any other behavior and governed by the same principles, then there would seem to be several advantages in teaching self-control techniques to individuals.

1. An individual can learn to effectively manipulate controlling responses thereby avoiding behaviors the individual considers undesirable (overeating, anxiety, obsessive thoughts, homosexuality) before they occur.

2. Children can receive self-control training as part of their socialization process from parents or schools. Large numbers of individuals can be trained rather than only those in a one to one, time-consuming, therapy situation.

Cautela (1969) calls this a sort of behavioral hygiene.

3. The scientific formulation that an individual is a product of his environment and therefore has no "free will" and in fact is governed by scientific laws is not readily accepted by many people. "In the traditional view, a person is free. He is autonomous in the sense that his behavior is uncaused. He can therefore be held responsible for what he does and justly punished if he offends" (Skinner, 1971, p. 19). This traditional concept is reflected in our history books, our constitution, codes, beliefs, churches, laws, etc. Because many teachers and parents are not of a science of behavior persuasion, it would be intrinsically more appealing to them to teach self-management procedures to children thus supporting their own learning history. The advantages of teaching self-control procedures to individuals is readily apparent from the large number of studies which have been done in this area within the last 10 years.

Skinner (1953) has defined the self-control process as one in which "the organism may make the punished response less probable by altering the variables of which it is a function. Any behavior which succeeds in doing this will automatically be reinforced. We call such behavior self-control (p. 230)."

Skinner describes nine methods to illustrate the process of self-control.

Physical Restraint and Physical Aid

The first of these involves applying physical restraint as in the case of clapping the hand over the mouth to reduce to probability of an offending remark. The controlling response is identified by the individual and some kind of physical restraint is imposed upon the response to be controlled. The response is reinforced because it reduces the aversive stimulation that the behavior may cause.

Changing the Stimulus

The second technique described by Skinner is manipulating either an eliciting or a discriminative stimulus. The occasion for a response can be changed by removing the discriminative stimuli or presenting stimuli to make a response more probable. This area has been investigated by Beneke & Harris (1972); Cautela (1966, 1967); Davison (1968); Goldiamond (1966); Hall (1972); Harris (1969); Homme (1965, 1966); McFall (1970); McFall & Hammen (1971); and Stuart (1967).

The method of covert sensitization was originally proposed by Cautela (1966). In this procedure the patient is taught relaxation techniques in the same manner as the desensitization procedure. He is asked to visualize the pleasurable object very clearly, for instance in the case of an alcoholic, to imagine an alcoholic beverage. He is then instructed to visualize that he is about to commit the undesirable act, raising the alcohol to his lips. At this

point he is told to imagine becoming sick to his stomach and actually vomiting all over his drink and himself. Patients often report at this point that they experience feelings of nausea. The therapist then describes feelings of relief such as rushing outside into the fresh air and again feeling fine. Presumably imagining the forbidden object (CS) is paired with imagining an aversive stimulus (UCS) and after several presentations the patient learns to associate feeling sick whenever he thinks about alcohol. The responsibility for treatment is gradually shifted from therapist to patient and the latter continues his self-administered therapy between visits. Cautela has reported successful treatment of cases involving alcoholism, obesity, homosexuality, and juvenile offenders involved in auto theft and glue sniffing (1967).

Homme (1965, 1966) has proposed the term coverant (covert and operant) to describe events that are observable only to the individual and are often described as thinking, reflecting, relaxing, imagining, and so forth. Homme's technique is based on the premise that a patient can exercise self-control by arranging events so that desirable behaviors come about due to pairing a negative coverant statement with a positive coverant statement and then engaging in a high probability behavior. The term for this type of behavioral engineering is contingency self-management. All that is required to strengthen a

coverant is that the subject to whom it is private demand that it occur immediately prior to the execution of some momentarily high probability behavior. An illustration of Homme's technique will demonstrate how self-control can come about by manipulating the occasion for a response. In the case of smoking, decide upon an aversive verbal event, some information about lung cancer perhaps, then think of a positive coverant, money saved on not buying cigarettes, for example, and lastly engage in a high probability behavior such as getting a cup of coffee.

In a case study involving a sexually sadistic male, Davison (1968) paired thinking of the undesired act with an unusually aversive graphically depicted event which the patient found highly discomforting. Changing the stimulus in this situation also involved advising the patient to masturbate while viewing pictures of sexually arousing females from Playboy Magazine instead of imagining a sadistic scene.

Stuart (1967) has outlined 12 case studies all involving overeating and the successful use of manipulating stimuli. His patients learn to pair feelings of hunger with other high probability behaviors such as making a phone call. Eating only in certain places and removing discriminative stimuli associated with food are other examples.

Harris (1969) found a significant difference between

an experimental group given instructions on weight control which included information about positive and negative reinforcement and stimulus control, and a control group not given any information. However, when the experimental group was divided into two groups, one group continuing the study of weight control and the other group undergoing aversive counter-conditioning (relaxation plus feelings of nausea to certain foods) the experimenter found no significant difference in weight loss.

Hall (1972) discovered that weight loss occurred in overweight females regardless of two types of presentation--experimenter-controlled or self-controlled. In the former, the patient selected a reinforcer as a goal to work for (such as a new dress) and also met weekly with the experimenter to discuss how much weight still needed to be lost. In the self-control condition the patients were taught methods of self-control.

Improvement of study habits was investigated by Beneke & Harris (1972). One group of students was taught a combination of methods of self-control including stimulus control, self-reinforcement and punishment. The second group only picked up written lessons and studied by themselves. There was no significant difference between the two groups in grade point average gains. However, both groups showed significant gains in GPA when compared to

controls.

Upon reviewing the literature on smoking, McFall & Hammen (1971) found that regardless of the procedure, subjects, or theoretical orientation, almost all data indicates a consistent V-shaped function. That is, smoking behavior drops to 30%-40% of baseline by the end of treatment and then climbs to 75% of baseline during the follow-up period approximately 6 months later. Secondary variables could possibly be responsible for the similarity of data. With this in mind, the experimenters manipulated only self-monitoring behavior. One of his four groups kept daily records of the number of cigarettes they smoked, the second group wore wrist counters and counted each cigarette smoked, the third group wore wrist counters and counted the number of smoking temptations they resisted, with the last group of subjects required to build up 20 points on their counters each day for resisting the temptation to smoke. There was no significant difference among groups in number of cigarettes smoked. He reported the same V-shaped function for his four groups as found in most earlier studies.

It is readily apparent that treatment effects may be confounded in self-counting research. McFall (1970) attempted to determine the effect of reactivity, that is the measurement operation itself affecting the behavior being measured. In this study observers unobtrusively counted

the number of cigarettes smoked by their experimental partners during an abnormal psychology class. After baseline measures were taken, one group of experimental subjects was told to count the number of cigarettes they smoked during class (smoke group). The other group was told to count the number of times the desire to smoke was overcome (no smoke group). The smoke group increased their cigarette smoking significantly during the self-monitoring phase and the no smoke group decreased their smoking significantly. These results indicate that self-counting is a reactive, data gathering procedure.

Goldiamond (1966) has demonstrated that self-control procedures can be taught by explaining to the patient the external and internal stimulus conditions, the schedule under which he operates, and the functional relationship between his actions and antecedent and subsequent environmental events. Once a person understands why he responds a certain way, he can attend to his behavior more objectively and manipulate the controlling variables. Several successful treatments are reported by Goldiamond of cases involving marital problems and study behavior.

Depriving and Satiating

Skinner's third technique for self-control involves the individual manipulating his behavior by satiation or self-deprivation. Examples of this could be seen in the dieter who counts calories; depriving oneself of a certain

number of calories in order to lose weight. Little controlled research falls into this area.

Manipulating Emotional Conditions

Individuals sometimes remove themselves from a scene which causes emotional reactions, like refusing to see a movie that purports to be very sad.

Aversive Stimulation

Arranging for an aversive stimulus to occur if a particular behavior is not executed is Skinner's fifth category. A personal illustration such as setting an alarm clock (an aversive stimulus) to awaken us is an example of this type.

Drugs

Drugs, such as appetite-depressants, are commonly employed to promote similar effects that self-control measures would bring about. Controlled research in this area is difficult to find.

Operant Conditioning

Much of the research on self-control has been done in the area of operant conditioning, discovering the relationship among the variables associated with not reinforcing one's own behavior until a particular response has been emitted. Experimenters have been concerned with demonstrating that the properties associated with self-reinforcement show some of the same properties as those associated with

reinforcement of another person.

Kanfer and associates have studied self-control by investigating the effects of degree of learning, pretraining, type of prior external reinforcement, motivation, noxious stimuli, and stability of patterns.

Kanfer, Bradley & Marston (1962) found that subjects who were given more trials in a discrimination task and then given control of the reinforcing stimulus made significantly more correct self-reinforcing responses. Incorrect self-reinforcement was associated with shorter training. In another study (Kanfer & Marston, 1963a) three groups learned a visual discrimination task to a criteria of 5/10 (low learning), 7/10 (medium learning), and 9/10 (high learning). Self-reinforcement, a light to indicate correct choice, and correct responses increased with length of learning. The effect of instructions was manipulated in the second part of the experiment. Three groups were given facilitating, inhibiting or no instruction. The facilitating group gave themselves more self-reinforcements but also made fewer correct responses than the other two groups.

The effects of pre-training was studied by varying the approval of the experimenter (Kanfer & Marston, 1963b). Subjects were presented with "subliminal" nonsense syllables and asked to select the proper response and estimate the correctness of the response. In the SR positive (facilitated)

group the experimenter smiled and expressed approval of the subject's choices; in the SR negative (inhibited) group, the experimenter was unsmiling and gave the poker chips begrudgingly. The results of this training phase showed that the facilitated group gave themselves reinforcements 58% of the time and the inhibited group only 0.2% of the time. A visual discrimination task was used in the testing phase. All subjects were asked to choose one nonsense syllable and spell it from a list of four nonsense syllables. After two blocks of 10 reinforced trials followed by three blocks of test trials, half the subjects were given an extinction procedure and half a self-reinforcement (SR) procedure. Subjects in the SR group could take a poker chip if they felt their decision was correct. The SR positive group gave a significantly greater number of SR's to themselves than the SR negative group. The control group fell between the two experimental groups. These results indicated that training differentially affected the total number of SR's.

Similar results were found by Kanfer & Duerfeldt (1967a) with subjects who were reinforced between 85%-97% of the time by an experimenter or between 35%-47% of the time. Subjects subsequently administered reinforcements according to their previous schedule of reinforcements. Subjects given few reinforcers by the experimenter similarly gave themselves few, and subjects given many reinforcers

gave themselves many. Subjects were also given 15 negative reinforcers (loud sounds of an automobile crash) during training and then given control over their administration. Changes in the subject's statements about his own performance were not accompanied by corresponding changes in the rate of negative reinforcement given. These results suggest that under some circumstances a high degree of correspondence between a person's verbal self-evaluative statements about a particular behavior and his tendency to administer self-reinforcement for the same behavior cannot always be taken for granted.

The results of prior reinforcement were investigated in a motor task requiring subjects to press buttons when a certain color in a bank of blinking lights stopped flashing (Kanfer & Duerfeldt, 1968a). Four groups were given either 50% positive noncontingent direct reinforcement (DR+) or 50% negative noncontingent direct reinforcement (DR-) by an experimenter during the training phase. During the second phase, control over the reinforcement, lights indicating successful (SR+) or unsuccessful (SR-), was given to the subjects. Results indicate that the subjects in the SR+ groups gave themselves significantly more reinforcements than the SR- groups. The former groups tended to match the number of reinforcements given in the training phase while the SR- group did not.

Motivational properties such as effects of age and class standing have also been studied. Kanfer (1966) found that third and fourth grade boys differed in frequency of incorrect SRs as a function of their assignment to the upper or lower half of their class by the teacher. Low performers gave more incorrect SRs and resisted temptation less frequently than high performers. In another study (Kanfer & Duerfeldt, 1967b), geometric figures were presented tachistoscopically to subjects for .05 seconds. A second slide was presented and the subject requested to choose the correct figure. After the initial training phase of experimenter-presented reinforcement, subjects were given control over the reinforcement, in this case a green light and accumulating points. The individuals in the group controlling their own reinforcement were superior in making correct responses over the group that continued to receive reinforcement from an experimenter or a control group receiving no reinforcement. In a later study (Kanfer & Duerfeldt, 1968b), the relationship of resistance to temptation and rank in class was found to be a function of age. The frequency of undeserved SRs decreased significantly with age.

Kanfer & Goldfoot (1966) manipulated the availability of responses to subjects for whom noxious stimulation was provided. The length of time a subject's hand remained

immersed in ice water was significantly affected by the external distraction made available. Female subjects who could describe slides of Europe were able to tolerate the painful stimulus significantly longer than subjects who verbalized the situation or watched the clock or who had received a negative set about the "painfulness" of the situation.

The invariance of self-appraisals across two distinctly different tasks involved a time estimation task (TET) and a word association task (WAS). The experiments (Kanfer, Duerfeldt, & LePage, 1969) were conducted in different buildings and by different experimenters and subjects later indicated that they believed the two studies to be separate. Subjects were asked to listen to a series of tones presented over earphones and then to estimate the length of time of the tone by pressing a button an equal length of time. Subjects could reinforce what they considered to be a correct choice and the experimenter could also reinforce correct responses. The high group gave themselves five or more reinforcements and those that fell into the low group gave themselves no reinforcements. The second study required the same subjects to respond with the "most imaginative association" to a word when presented on a tape. One-half the subjects received a verbal "correct" and one-half received "incorrect." Control over the rein-

forcement was then given to the subject. The results indicate that self-reward (SR+) and self-criticism (SR-) apparently are not related. Subjects in the SR+ group matched the experimenter's administration of reinforcement; however, the SR- group did not match previously administered self-criticism. Another result of this experiment was the consistency of SR+ patterns on the two different tasks. Subjects who had shown high rates of SR+ on the first task, continued to differentiate themselves from the low self-rewarders on the second task.

In an attempt to test the effect of incentives in a self-reinforcement paradigm, Marston & Kanfer (1963) offered three groups of subjects either a green light, green light plus poker chips, or poker chips which could be traded in for prizes. Phase I consisted of learning nonsense syllables to a criterion of 6/10. The groups were then divided according to reinforcement administration, either a continuation of experimenter controlled reinforcement, self-reinforcement, or no reinforcement. The results show that these incentive conditions have no effect on correct responses; however, the group given reinforcement by the experimenter increased significantly over trials in correct responses while the no reinforcement group significantly decreased. Higher incentives produced fewer SR's after an incorrect response.

Two experiments involving testing the effects of different "personalities" of subjects and their subsequent self-reinforcement pattern have been done by Marston. In the first of these (Marston, 1964), subjects were given Bass's Orientation Inventory (ORI) and Rotter's Internal-External Control of Reinforcements Scale. Scores on the ORI determined whether subjects were classified as self-oriented, interaction-oriented, or task-oriented. The Rotter's Scale purports to measure how an individual views control over his reinforcements, as governed by the external world or himself. Results indicate that subjects who had high faith in their ability to control the environment and those subjects who were task-oriented increased in self-reinforcements over trials while those subjects who felt their reinforcements were under "external" control decreased over trials. Interaction-oriented and self-oriented subjects did not change.

In a similar study (Marston & Cohen, 1966), individuals were divided into three groups on the basis of scores from the Kuder-Richardson test for introjectiveness. Those with high scores tend to view themselves as responsible for success or failure rather than viewing external sources as responsible. The effect of frustration was tested by requiring one group to attempt to put together a difficult puzzle. Only the medium introjective group took

significantly more negative self-reinforcement as opposed to either the high or low group, which did not differ from each other. Subjects who were frustrated gave themselves significantly more negative self-reinforcement than the non-frustrated subjects.

To determine what are the variables affecting self-reinforcement and reinforcement of another person, Marston (1965) exposed groups to varying rates of reinforcement. In one group subjects listened to a model increase his rate of self-reinforcement from 2/10 to 8/10 at an increasing monotonic rate; another group was exposed to a model whose rate remained constant at 2/10; and a control group who was not exposed to a model. When the subjects were subsequently required to reinforce another person for responses, it was found that the model previously exposed to was imitated. Competence of the model was tested in the second part of the experiment and found to be related to both the prior rate of self-reinforcement and the characteristics of the response.

A self-reinforcement paradigm was used in a study done by Rehm & Marston (1968). College males who reported anxiety in social situations were to reinforce their appropriate social behavior according to a predetermined point scale. Two other groups were given either non-directive therapy or no therapy. The experimental group yielded

greater improvement scores on the Taylor Manifest Anxiety Scale, Gough Adjective Check List, a situation test devised by the experimenters, a post-test as compared with a pre-test, and the Fear Survey Schedule.

Mischel has investigated the variables affecting delay of gratification. Self-control was defined as the ability to postpone gratification in choosing a delayed, but larger reward over an immediate smaller reward. In a study using elementary school students as subjects, Mischel & Metzner (1962) found an abrupt change in desire for delayed rewards between the third and fourth grades. In addition to a significant relationship between age and preference for delayed reward, they found that IQ affects preference choices with the students with high IQ's more often choosing delayed rewards.

In another study to investigate achievement motivation, cheating behavior and reward preference, Mischel & Gilligan (1964) found that students who tested high on the TAT were more likely to cheat on scores involving a shooting gallery game than low TAT scorers. In the same study, preference for delayed reward was positively correlated with resistance to cheating and to delay before cheating on the score.

Mischel & Staub (1965), investigated the role expectancy plays in determining preference for delayed and

larger rewards. Statements were obtained from students about how well they expected to perform on verbal reasoning and general information tasks. Later subjects were required to do four sets of problems and each received predetermined success or failure scores. The dependent measure was choice between an immediate smaller reward or a larger reward contingent on waiting, or performing another task, either similar or dissimilar and waiting. Larger rewards were chosen significantly less frequently when they were dependent on successful task performance than when they required only waiting. The effect of the earlier test on expectancy was not significant. In other words, how a subject felt he could do on tasks did not affect his reward choices. All subjects in the success groups choose significantly more large, delayed rewards when the contingencies were similar, but not when they were dissimilar. There was no difference between success and failure groups with regard to dissimilar contingencies.

Mischel & Liebert (1966) found that subjects tend to transmit to others the same reward patterns which they adopt for themselves as a function of the criteria imposed by a model. Subjects received predetermined bowling scores and observed a model under one of three conditions. The model could impose equal standards thus reinforcing both herself and the subject only when the score was 20 points. In the

second condition, the model must achieve more stringent conditions than the subject (model 20, subject 15 or 20), and the third condition was just the reverse of the second (model 15 or 20, subject 20 points). Results indicate that when the subjects bowled with another person, the greatest stringency was imposed by the first group (model 20, subject 20). Subjects who were trained on a stringent criterion, but observed a model who was lenient (model 15 or 20, subject 20) tended more often to be stringent in giving scores than those in the reverse condition.

Bandura has investigated what the effect of exposure to a model would have on subsequent self-reinforcement. The following studies all involve elementary students. Both an adult and peer model were used in an effort to determine if children respond differently to adults than to peers (Bandura & Kupers, 1964). In the high criterion group, the model rewarded himself with candy only if he had a score of 20 points or more; in the low criterion group only 10 points were needed for a reward. Children matched adult models more than peer models; sex of the model made no difference.

Another study (Bandura & Whalen, 1966) investigated what effects success or failure on a related task would have on subjects observing models in the bowling task. Once again models took rewards only when their score reached a certain criteria--superior model, moderately high, or inferior. As

before the students modeled the models. Success or failure on the earlier task did not make a difference except in the case of the inferior model group. Subjects in this group rewarded themselves less often.

The effects of observational learning were tested in another study (Bandura & Grusec, 1966). Subjects were divided into three groups and given different sets of instructions before watching a movie. The facilitative symbolization group was instructed to verbalize the model's actions; the competing symbolization group had to count throughout the movie and the passive observation group was instructed to just watch the movie. The dependent variable was the number of behaviors of the model that the subjects could reproduce after the movie. Group 1 did better than the third group, and Group 3 did better than the second group. Incentive (promise of candy) made no difference in performance.

Bandura & Perloff (1967) exposed subjects to externally imposed reinforcement and self-monitored reinforcement. Subjects were required to rotate a wheel to accumulate points. Poker chips were dispensed as rewards to be traded in later for prizes. Each subject could set an indicator to the number of points he wanted to accumulate. In the self-monitored reinforcement group as many chips could be taken as desired upon completion of the required rotations

regardless of whether the subject choose 32 wheel turns for 20 points or only 8 wheel turns for five points. The second group was yoked to the first in that the same score and same number of rewards were used as determined by subjects from the first group. The third group was an incentive control group. They were given all the tokens at the beginning of the experiment. The self-monitored and the externally reinforced groups sustained more behavior than the incentive control. An interesting result is that all children imposed unfavorable schedules of reinforcement on themselves, thereby exerting a high level of physical effort for only a few chips. The experimenters did not observe the subjects during the operation of the equipment so the children could have manipulated only the dispenser thus accumulating many rewards and expending no physical effort turning the wheel; however, this did not occur.

Punishment

Punishment is aversive stimulation which is contingent upon a given response. Researchers in this area (Duncan, 1969 and Mathie, 1967) demonstrated that self-punishment can be arranged by the individual and the outcome is the same as would be generated by the same stimulation arranged by others.

Duncan taught teenage volunteers to pinpoint, count, and record behaviors that they wished to decrease such as

nail biting and sarcastic remarks. Restraint measures considered aversive to the subjects were made contingent on the occurrence of the unwanted behavior. In the nail biting case, large red mittens were worn for 5 minutes whenever the subject found herself biting her nails. Similarly in the case of sarcastic remarks, application of a surgical gauze mask was contingent upon the behavior in question. Duncan reports successful projects from 33 out of 55 students. Apparently no planned reversals were attempted; however, in the case of nail biting, when the subject omitted the mittens after 17 days on the contingency-consequence, nail biting increased. Conversely, in the case of knuckle cracking, when the contingency was withdrawn after 3 days, the behavior decreased even further. In case studies of this kind, it is difficult to demonstrate that changes in the dependent variable are due only to the manipulation of the independent variable. Wanting to please the experimenter, counting by itself, and other factors could be responsible for changes in the behavior.

Mathie (1967) has reported case studies involving patients who have successfully applied self-punishment to behaviors such as voyeurism, temper outbursts, and what the patient considered excessive masturbation.

"Doing Something Else"

Skinner's last category involves escaping from the

aversive stimulation generated by the behavior by doing the opposite. In effect, this is practicing being calm in the face of fearful events. Also falling into this category are behavioral explanations of Freud's defense mechanisms. Skinner sees defense mechanisms such as sublimation, displacement, and projection as terms given to the behavior of an individual who is practicing self-control by doing something else. As an example, reaction formation is said to occur when an individual engages in a behavior which is just opposite to the impulses he desires. Freud saw this as a symptom of an inner illness. Skinner sees it as being an exercise in self-control. That is, an individual keeps himself from engaging in a behavior which leads to punishment by energetically engaging in something else. Likewise the other defense mechanisms are also subsumed under this category.

As can be seen from the studies cited, self-control can be investigated by a variety of methods and with different kinds of subjects. Interest has recently been centered around teaching self-control methods to students in classrooms. In a study by Broden, Hall, & Mitts (1971) an eighth-grade student was required to mark slips of paper indicating the amount of time spent studying in an effort to increase studying behavior. Teacher attention was also introduced into the paradigm. Studying behavior increased from 30% during baseline conditions to from 78%-88% of the

time per session during self-recording conditions. A second student was asked to record the number of talk-outs. No teacher attention was used with this student; talk-outs dropped from a baseline of 1.1 to 1.6 per minute to 0.3 to 1.0 during self-recording sessions.

The purpose of this investigation is to explore some of the variables associated with self-management and specifically to determine if students as young as first-grade can be taught to modify their own behavior by self-counting.

CHAPTER II

METHODS

The subjects were three first-grade students, two boys and one girl enrolled in an elementary school in Des Moines, Iowa. Before any data collection occurred, the experimenter observed the classroom for 15 hours during which time the three students exhibiting the most disruptive behaviors were chosen. Disruptive behaviors were defined as talking out excessively, moving seats about the room, running, hitting others, and preventing other students from completing assignments.

The students were observed for 40 minutes a day, 15 minutes before they left their classroom to participate in a reading group and for 25 minutes after they returned. The dependent variable selected was out-of-seat behavior, since few of the disruptive behaviors described above could occur if the students were in their seats.

Although the teacher's daily plan called for many activities to be done in small groups or as an entire class, during this particular 40 minute interval the students were assigned three daily worksheets to be completed individually in their seats. These worksheets consisted of a math paper, a picture to color, and a story to write. Throughout the experiment, counting began after the papers had been distributed.

Data were recorded on sheets by marking squares, representing 10 second intervals, with either a plus (+) or a minus (-). The plus indicating in-seat and the minus indicating out-of-seat (or within exceptions outlined below). Baseline data were collected for 6 days. Students were not aware their behaviors were being counted during baseline sessions.

Phase I-A

Student 1 was given a wrist counter and asked to click the counter each time she got out of her seat. Two exceptions were explained to the student, going to the bathroom and if the teacher or another adult requested that the student get out of her seat. During this phase Student 1 was verbally reinforced by the experimenter for accurate counting only. (Verbal reinforcement consisted of saying things like, "That was a good job of counting" or "I am so glad that you remember to count each time you get out of your seat.") No other behavior was reinforced. Reinforcements occurred at the end of the first 15 minute period and at the end of the data collection period for the day.

Student 2 was given a wrist counter and asked to record how many times the teacher told the students to go sit down. This particular aspect of the experimental paradigm was designed to control for the possibility that wearing a wrist counter and receiving attention from the experimenter

may by itself bring about a change in behavior.

Student 3 served as a control. His out-of-seat behavior was recorded in the same manner as Subjects 1 and 2. Throughout the sessions he was unaware his behavior was being recorded.

At the end of the 40 minute period, Subjects 1 and 2 graphed their wrist counter readings on graph paper with the help of the experimenter. Phase I-A was conducted for 11 days.

Phase I-B

All instructions to students remained identical to Phase I-A. Now, however, Student 1 was verbally reinforced by the experimenter for staying in her seat and completing her worksheets. Student 1 was instructed to hold up her hand when she completed a paper to enable the experimenter to quickly attend to appropriate behavior. Verbal reinforcement was also given at the end of the 15 minute period before reading class and at the end of the daily period while the students were recording their results. Phase I-B was conducted for 5 days.

Phase II

In the second phase, sessions 23-30, instructions to Students 1 and 2 were interchanged. Student 2 was now told to count his out-of-seat behavior and Student 1 was told to count the number of times the teacher told students to go

sit down. Verbal reinforcement was given Student 2 in the same manner as described for Student 1 in Phase I-B.

Twenty-one days after the last experimental session a follow-up study was conducted. Out-of-seat behavior was again recorded for all three students for one session.

The dependent variable, percentage of time out-of-seat, was determined for each student daily by dividing the number of minus intervals by the total number of intervals and multiplying by 100 to obtain a percentage figure.

In addition to the experimenter, an observer counted out-of-seat behavior once during baseline and once during each phase. A total interval method of calculating interobserver reliability was determined by dividing the total number of intervals in agreement by the total number of intervals observed and multiplying by 100 to obtain a percentage figure.

This technique of determining interobserver reliability has recently been questioned. In a paper presented at the 3rd annual Conference on Behavior Analysis in Education in Lawrence, Kansas in May 1972, Robert Hawkins observed that even if one observer turned in a blank score sheet, reliability scores can range from 70% to 100% agreement. Behaviors which occur at either a high frequency or a low frequency can cause spurious measurement results. For this reason he suggested using a second method of calculating

reliability as described by Bijou, Peterson, & Ault (1968). This method consists of dividing the total number of intervals in which both observers agreed that the behavior occurred by the total number of intervals in which either of the observers or both agreed the behavior occurred. The reliability indices are compared as follows: Baseline, first method - 98.2% and second method 97.5%; Phase I - 97.0% and 96.5%; and Phase II - 98.6% and 98.3% respectively.

CHAPTER III

RESULTS

Student 1

Figure 1, page 32, shows the percent of time Student 1 was out of her seat during the experiment. During baseline the student spent an average of 35% of the time out of her seat during the daily observation period.

Phase I-A indicates the change in out-of-seat behavior when the experimenter verbally reinforced her for accurate counting. The student's behavior dropped to an average of 13%. At the start of session 18, Phase I-B, the experimenter began verbal reinforcement at appropriate intervals for in-seat behavior. The out-of-seat behavior for Student 1 during this phase dropped to zero.

Phase II was instituted at the beginning of the 23rd session and the student was requested to stop counting her behavior and start counting the teacher's verbal behavior--the number of times she told students to sit down. As the graph indicates, the student's out-of-seat behavior returned to almost baseline levels, averaging 29%.

Student 2

Figure 2, page 33, reveals the out-of-seat behavior for Student 2 for the entire 30 sessions. During baseline conditions he was out of his seat on an average of 40% of the time. While he was counting his teacher's verbal be-

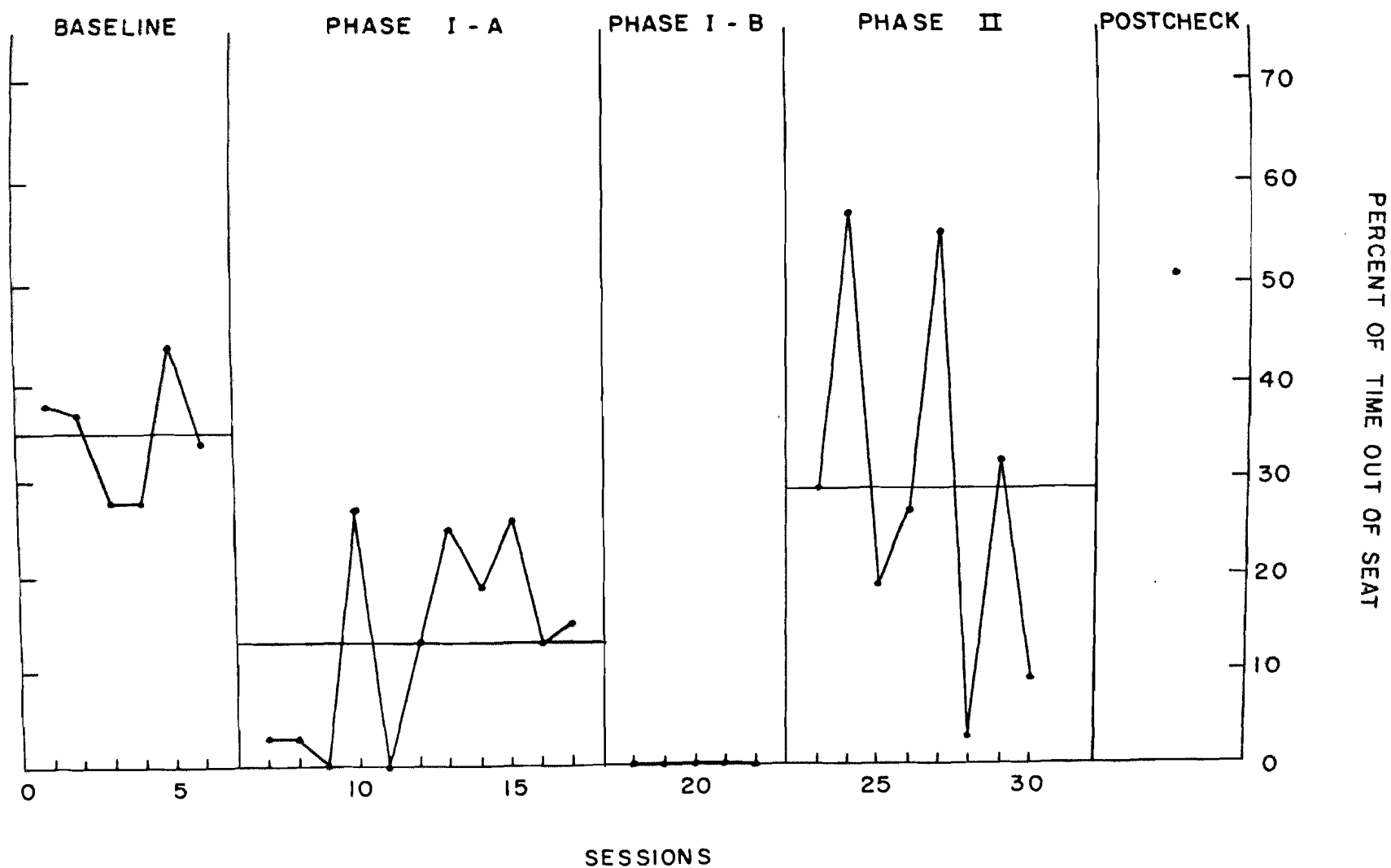


FIG. 1. PERCENTAGE OF TIME STUDENT I WAS OUT OF HER SEAT DURING BASELINE AND EXPERIMENTAL PHASES.

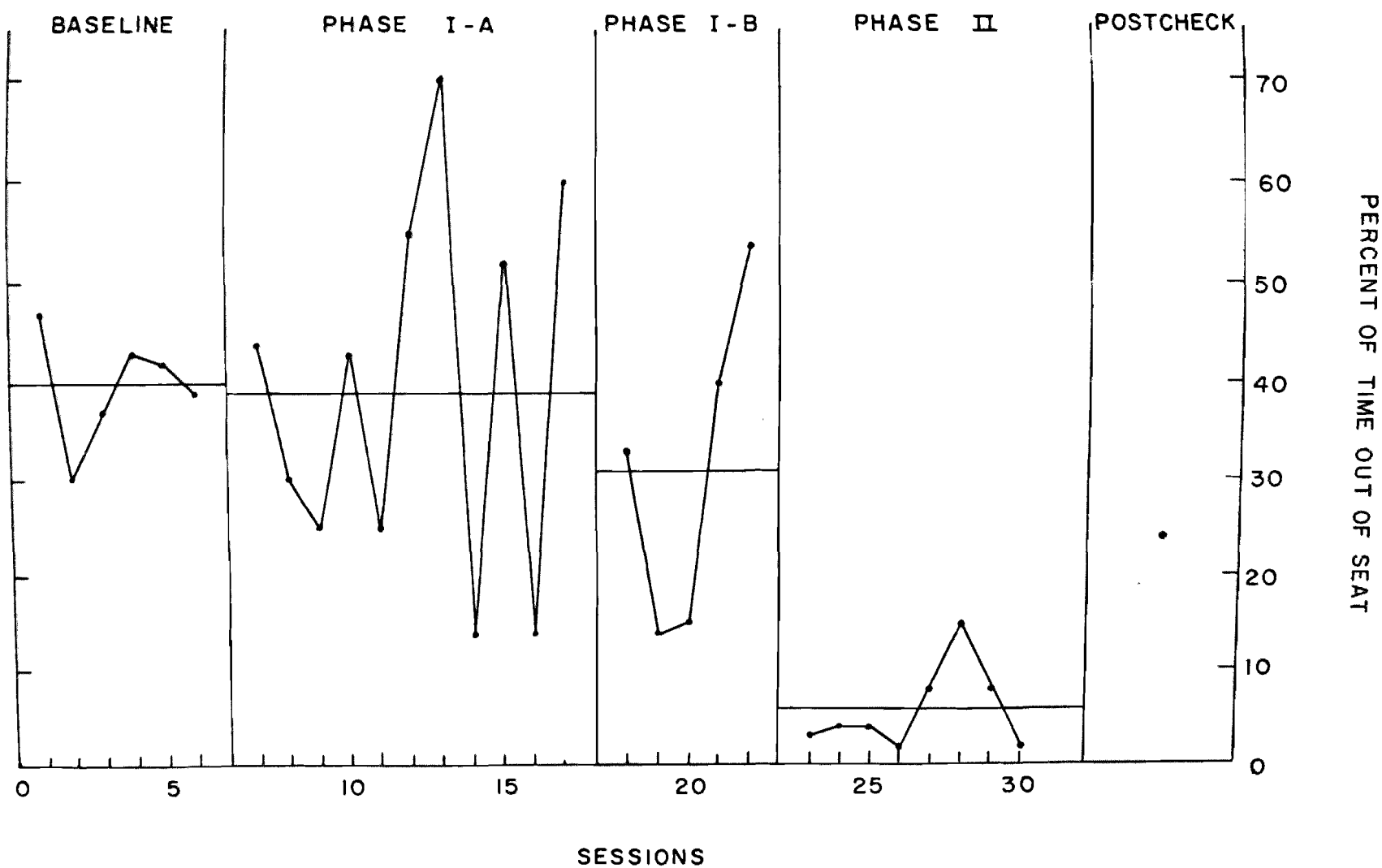


FIG. 2. PERCENTAGE OF TIME STUDENT 2 WAS OUT OF HIS SEAT DURING BASELINE AND EXPERIMENTAL PHASES.

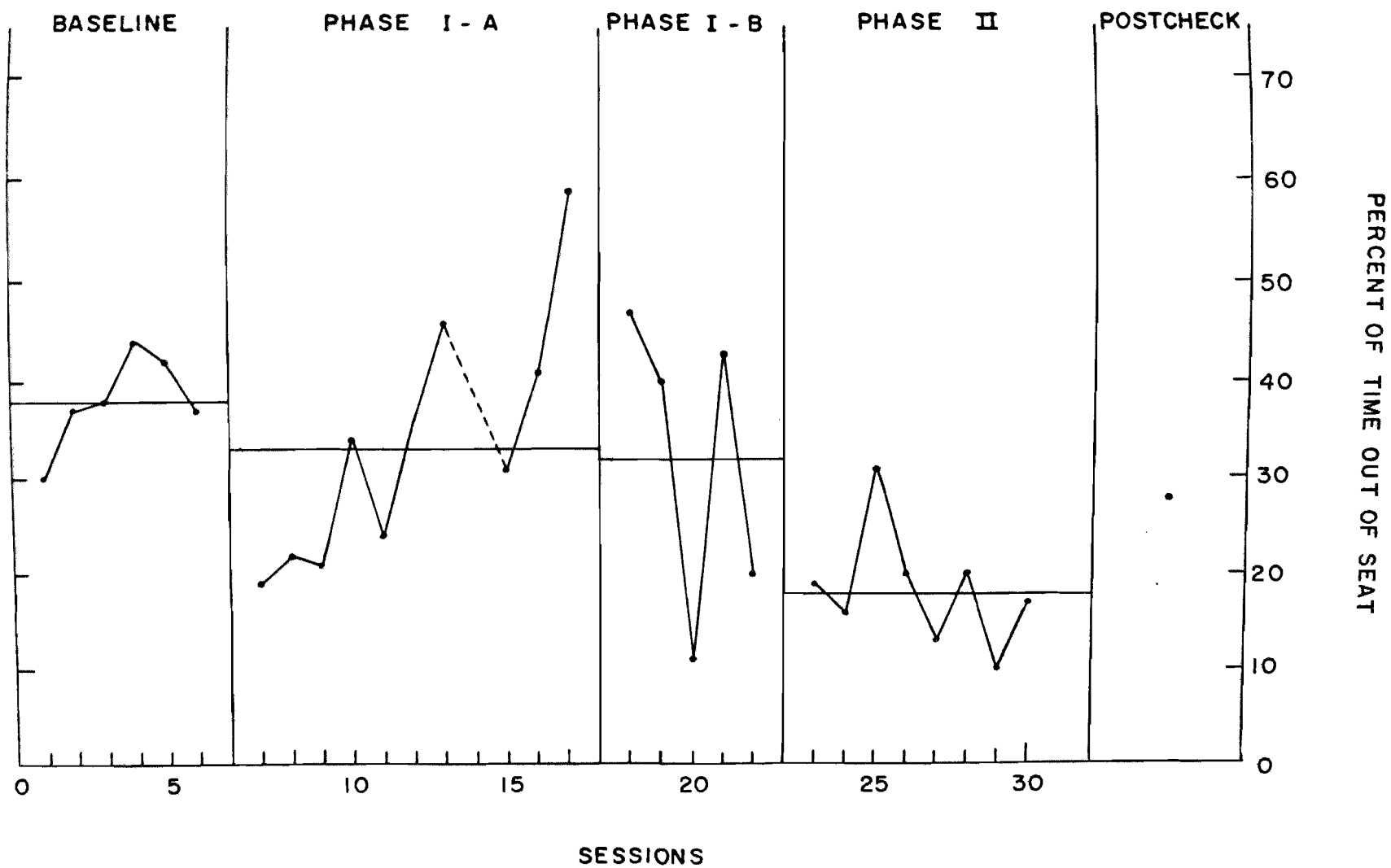


FIG. 3. PERCENTAGE OF TIME STUDENT 3 WAS OUT OF HIS SEAT DURING BASELINE AND EXPERIMENTAL PHASES.

havior in Phase I-A and Phase I-B, he was out of his seat on an average of 35% of the time. When Phase II was introduced his out-of-seat behavior dropped to approximately 6% of the time.

As will be noted, there is no Phase II-A. Student 2 was not reinforced for accurate counting as was Student 1 in Phase I-A. One of the variables of interest in this experiment was to observe the effect of reinforcing accurate counting. For this reason Student 1 was verbally reinforced for accurate counting and Student 2 was not. However, no systematic effort was made to record any data other than the usual out-of-seat behavior.

Student 3

The control student, Student 3, was unaware his behavior was being counted throughout all the sessions. As can be seen from Figure 3, page 34, during baseline his out-of-seat behavior averaged 38%, and during Phase I he averaged 32.5%, and during Phase II he was out of his seat on an average of only 18% of the time.

A follow-up session conducted 21 days after the last experimental session revealed that Student 1 was out of her seat 51% of the time; Student 2, 24%; and Student 3, 28% of the time.

Sessions 6, 7, 11, 12, 14, 15, 18, 24, 29, and the follow-up are based on less than 40 minutes for either one

or all three students. In an elementary classroom there are often unplanned events such as films being shown, going to the dentist, early recess, not returning until late from a reading class, etc. This made counting all three students simultaneously for the full 40 minutes on the above sessions impossible.

CHAPTER IV

DISCUSSION

This study indicated that it is possible to use self-management procedures paired with verbal reinforcement to modify out-of-seat behavior for students in a first-grade public classroom.

In the case of Student 1, it was apparent that verbal reinforcement for only accurate counting in Phase I-A did not maintain in-seat behavior. After the first 3 days, sessions 7, 8, and 9, in which her out-of-seat behavior dropped to nearly zero, this behavior increased to an average of 17% for the rest of Phase I-A. However, sessions 10 and 13 were the days before holidays and more activity was going on in the classroom (making Easter baskets and shamrocks) and all three students showed an increase in out-of-seat behavior on those days.

Phase I-B was begun on session 18 and Student 1 was now reinforced for staying in her seat and completing her worksheets. As can be seen from Figure 1, her out-of-seat behavior dropped to zero and stayed there for 5 sessions.

During Phase II Student 1 showed somewhat erratic behavior. In this phase all she was counting was the number of times the teacher asked the students to go sit down. On the 24th and 27th days she was out of her seat over 50% of the time, but on the 28th day of the experiment she was

only out of her seat 3% of the time. Two reasons for this are suggested: First, during baseline conditions, the teacher repeatedly asked all students to sit down. She decreased this request considerably throughout the sessions even though she was asked to keep her behavior the same. Not being told to sit down could possibly account for some of the out-of-seat behavior of Student 1 during this phase. Second, it was also noted that Student 1 was so intent on "keeping her counter on zero" during Phase I-B that she had difficulty switching to a different behavior to count. She checked with the experimenter often during session 23 to be sure that she was counting the right thing.

During Phase I-B the experimenter reinforced Student 1 for staying in her seat and completing her worksheets. Reinforcement consisted of praise at the completion of each worksheet. She was instructed to raise her hand to indicate to the experimenter, that she had completed one worksheet. The same procedure was followed with Student 2 in Phase II.

The instructions to Student 2 during Phase I were to record the number of times the teacher said to sit down. This part of the design was included to control for the possible effect of wearing a wrist counter, being part of a classroom experiment, and receiving attention from the experimenter. As can be seen from Figure 2, during Phase I Student 2 was out of his seat only slightly less than dur-

ing baseline conditions.

Student 1 and Student 2 differed considerably in their ability to count out-of-seat behavior accurately. As will be recalled, only one of the experimental students was reinforced for accurate counting. Student 1 during Phase I-A was verbally reinforced for a period of 11 sessions for accurate counting only. During that time and throughout all of Phase I she did not need to be reminded by the experimenter to click the counter. At the end of each session the data of both Student 1 and the experimenter always agreed. In contrast, Student 2 was not reinforced for accurate counting and throughout Phase II he would often forget to click his counter when he left his seat. The experimenter prompted him on those occasions. On only two occasions did the data of the experimenter and of Student 2 not agree. Although there was no systematic effort to assess this parameter, there may be some evidence from this experiment that counting may be more accurate if that behavior is reinforced, at least with a population as young as first-grade.

As can be seen from Figure 3, the out-of-seat behavior for Student 3, the control student, also decreased. During the first part of the experiment, Student 3 sat by himself at the front of the room--his desk being directly adjacent to the teacher's desk. The teacher felt that he

was "hyperactive" and needed more attention than the other students and that in her opinion he needed a mild tranquilizer. Several students had their seats changed after vacation which coincides with session 18 on Figure 3--Student 3 was one of these. He was moved to a seat, by himself, in a row near the door, but this time facing the other students. His out-of-seat behavior dropped to new lows for him; on session 20 he was out of his seat only 11% of the time and on session 22, only 20% of the time. At the beginning of session 23 he was again moved to another desk, this time he was given a seat in the front row with a good friend as a seatmate. As can be seen, his out-of-seat behavior dropped to an average of only 18% of the time for this phase.

Twenty-one days after the last session, data on out-of-seat behavior was again collected for follow-up purposes. Student 1 was out of her seat 51% of the 40 minute period, even more than during baseline when she averaged 35%. The teacher felt that Student 2 had improved as he was sitting for longer periods of time and completing his work on time each day. His out-of-seat behavior was approximately half that recorded during baseline--24% compared with 40%. Student 3 once again had his seat changed. The teacher reported that when he was allowed to sit with a friend he accomplished more, so therefore she usually let him sit with a

friend. His out-of-seat behavior during the follow-up session was 28%, less than the 38% average observed during baseline, but higher than the average during Phase II which was 18%.

Because many of the other 20 students expressed a desire to be part of the experiment and wear a wrist counter, the experimenter made arrangements with the teacher so that each student could have a turn at wearing a wrist counter. This was not part of the experiment and no record was made of who wore it or what effect it had on the subsequent behavior. On two different occasions the teacher inadvertently gave the wrist counter to the control student. On session 7, Student 3 wore it the entire period. On session 28 he wore it only 15 minutes at which time the experimenter observed him ask someone to pick up a sheet of paper for him which had fallen on the floor because he did not want to get out of his seat. The experimenter retrieved the wrist counter from the control student at that point. On the seventh session he was out of his seat 19% of the time as compared with the average of 33% of the time for the rest of that phase, and on session 28 he was out of his seat 20% of the time as compared with his average for Phase II of 18%.

Although no attempt was made to systematically record any of the other student's behavior while they wore

the extra wrist counter, it was noted that the effect of self-counting varied with each individual child. Some students made a determined effort to stay in their seat and reported to the experimenter at the end of the period that they were able to "keep the counter on zero." Other students did not record any out-of-seat behavior even though they were observed to have been out of their seats frequently.

It seemed apparent from the results of the experimental students in this study and the observation of the other students, that wearing a wrist counter and counting the number of times out-of-seat, will not by itself maintain in-seat studying behavior. The combination of self-recording and praise is needed to accomplish in-seat working behavior. This combination is apparently necessary for two-reasons: First, a teacher in a roomful of active first-graders observes some students in their seats working so infrequently that it is difficult to "catch" them and reinforce their appropriate behavior. Wrist counters can be used to increase the probability of that particular behavior so the teacher can help establish and maintain in-seat, studying behavior through appropriate verbal reinforcement.

The second reason it seems necessary to use praise associated with self-counting is that many first-graders

find it difficult to sit in their seats and complete assigned work. Increasing skill in making letters or in solving math problems is usually so gradual as not to be effective in keeping a child on task. Therefore, praise is incorporated to maintain academic behavior.

In this regard the first-grade population differs from the population of adult smokers in McFall's (1971) study. He found that subjects can decrease their smoking behavior by wearing a wrist counter and counting the number of successful attempts of resisting a cigarette. His subjects were "motivated" to stop smoking. That is, they all openly expressed their desire to stop smoking. In the present study the students were not "motivated" to stay in their seats. It is not surprising that young children find wearing a wrist counter and noting only small changes in daily behavior not especially reinforcing. Self-counting apparently must be supported by more immediate reinforcement. A graph indicating in-seat behavior changes may in fact be more reinforcing to the teacher who can then find an additional opportunity to reinforce the student's in-seat behavior.

Also of interest in this study was what effect self-counting in the regular classroom would have on subsequent behavior in the reading class. The three subjects were also observed in their reading classroom which was conducted by

two different teachers alternating days. The number of disapproving remarks made to each of the three students for other than academic behavior were recorded. This was suspended during the second phase for several reasons. First, there was a considerable difference in the way the two reading teachers handled disruptive behavior. It was soon apparent that the children were "good" on some days and "disruptive" on other days due to the attention paid to each kind of behavior by the teacher. Secondly, one of the reading teachers began verbally reinforcing appropriate behavior at a much higher rate than previously during the last half of the experiment. The students responded by being less disruptive for that teacher.

No attempt was made to incorporate teacher attention or approval into this experimental paradigm. Other studies (Broden et al., 1971) have suggested that teacher attention and self-counting can be used to increase study behavior.

References

- Bandura, A., Grusec, J. E. & Menlove, F. L. Observational learning as a function of symbolization and incentive set. Child Development, 1966, 37, 499-506.
- Bandura, A. & Kupers, C. K. Transmission of patterns of self-reinforcement through modeling. Journal of Abnormal and Social Psychology, 1964, 69, 1-9.
- Bandura, A. & Perloff, B. Relative efficacy of self-monitored and externally imposed reinforcement systems. Journal of Personality and Social Psychology, 1967, 7, 111-116.
- Bandura, A. & Whalen, C. K. The influence of antecedent reinforcement and divergent modeling cues on patterns of self-reward. Journal of Experimental and Social Psychology, 1966, 2, 373-382.
- Beneke, William M. & Harris, Mary B. Teaching self-control of study behavior. Behavior Research & Therapy, 1972, 10, 35-41.
- Bijou, Sidney W., Peterson, Robert F., & Ault, Marion H. A method to integrate descriptive and experimental field studies at the level of data and empirical concepts. Journal of Applied Behavior Analysis, 1968, 1, 175-191.
- Broden, Marcia, Hall, R. Vance, & Mitts, Brenda. The effect of self-recording on the classroom behavior of two

- eighth-grade students. Journal of Applied Behavior Analysis, 1971, 4, 191-199.
- Cautela, J. R. Treatment of compulsive behavior by covert sensitization. Psychological Record, 1966, 16, 33-41.
- Cautela, J. R. Covert sensitization. Psychological Reports, 1967, 20, 459-468.
- Cautela, J. R. Behavior therapy and self-control: Techniques and implication. In C. M. Franks (Ed.) The assessment and status of the behavior therapies and associated development. New York: McGraw-Hill, 1969.
- Davison, G. C. The elimination of a sadistic fantasy by a client-controlled counterconditioning technique: A case study. Journal of Abnormal Psychology, 1968, 73, 84-90.
- Duncan, Ann. Self-application of behavior modification techniques by teenagers. Adolescence, 1969, 4, 541-546.
- Gouldiamond, Israel. Self-control procedures in personal behavior problems. In Roger Ulrich, Thomas Stachnik, and John Mabry (Eds.) Control of human behavior. Glenview, Illinois: Scott, Foresman and Co., 1966.
- Hall, Sharon Martinelli. Self-control and therapist control in the behavioral treatment of overweight women. Behavior Research & Therapy, 1972, 10, 59-68.
- Harrie, M. B. Self-directed program for weight control: A

pilot study. Journal of Abnormal Psychology, 1969, 74, 263-270.

Hawkins, Robert P. & Dotson, Victor A. Reliability scores that delude: An alic in wonderland trip through the misleading characteristics of inter-observer agreement scores in interval recording. Paper presented at the Third Annual Conference on Behavior Analysis in Education at Lawrence, Kansas, May 1972.

Homme, L. E. Perspectives in psychology XXIV. Control of coverants, the operants of the mind. Psychological Record, 1965, 15, 501-511.

Homme, L. E. Contiguity theory and contingency management. Psychological Record, 1966, 16, 233-241.

Kanfer, F. H. The influence of age and incentive conditions on children's self-rewards. Psychological Reports, 1966, 19, 263-274.

Kanfer, F. H., Bradley, M. M. & Marston, A. R. Self-reinforcement as a function of degree of learning. Psychological Reports, 1962, 10, 885-886.

Kanfer, F. H. & Duerfeldt, P. H. The effects of pretraining on self-evaluation and self-reinforcement. Journal of Personality and Social Psychology, 1967, 7, 164-167 (a).

Kanfer, F. H. & Duerfeldt, P. H. Motivational properties of self-reinforcement. Perceptual and Motor Skills,

1967, 25, 237-246 (b).

Kanfer, F. H. & Duerfeldt, P. H. A comparison of self-reward and self-criticism as a function of types of prior external reinforcement. Journal of Personality and Social Psychology, 1968, 8, 261-268 (a).

Kanfer, F. H. & Duerfeldt, P. H. Age, class-standing and commitment as determinants of cheating in children. Child Development, 1968, 39, 545-557 (b).

Kanfer, F. H., Duerfeldt, P. H. & LePage, A. L. Stability of patterns of self-reinforcement. Psychological Reports, 1969, 24, 663-670.

Kanfer, F. H. & Goldfoot, D. A. Self-control and tolerance of noxious stimulation. Psychological Reports, 1966, 18, 79-85.

Kanfer, F. H. & Marston, A. R. Determinants of self-reinforcement in human learning. Journal of Experimental Psychology, 1963, 66, 245-254 (a).

Kanfer, F. H. & Marston, A. R. Conditioning of self-reinforcing responses: An analogue to self-confidence training. Psychological Reports, 1963, 13, 63-70 (b).

Marston, A. R. Personality variables related to self-reinforcement. Journal of Psychology, 1964, 58, 169-175.

Marston, A. R. Imitation, self-reinforcement and reinforcement of another person. Journal of Personality and Social Psychology, 1965, 2, 255-261.

Marston, A. R. & Cohen, N. J. The relationship of negative self-reinforcement to frustration and intropunitiveness. Journal of General Psychology, 1966, 74, 237-243.

Marston, A. R. & Kanfer, F. H. Human reinforcement: Experimenter and subject controlled. Journal of Experimental Psychology, 1963, 66, 91-94.

Mathie, James. The elimination of undesirable behavior through self-administered negative reinforcement. Address delivered: Brocksville VA Hospital, Brocksville, Ohio; second annual conference on Man's Adjustment, 1967.

McFall, R. M. The effects of self-monitoring on normal smoking behavior. Journal of Consulting and Clinical Psychology, 1970, 35, 135-142.

McFall, R. M. & Hammen, C. L. Motivation structure and self-monitoring: The role of nonspecific factors in smoking reduction. Journal of Consulting and Clinical Psychology, 1971, 37, 80-86.

Mischel, W. & Gilligan, C. Delay of gratification, motivation for the prohibited gratification, and responses to temptation. Journal of Abnormal and Social Psychology, 1964, 69, 411-417.

Mischel, W. & Liebert, R. M. Effects of discrepancies between observed and imposed reward criteria on

- their acquisition and transmission. Journal of Personality and Social Psychology, 1966, 3, 45-53.
- Mischel, W. & Metzner, R. Preference for delayed reward as a function of age, intelligence and length of delay interval. Journal of Abnormal and Social Psychology, 1962, 64, 425-431.
- Mischel, W. & Staub, E. Effects of expectancy on working and waiting for larger rewards. Journal of Personality and Social Psychology, 1965, 2, 625-633.
- Rehm, Lynn P. & Marston Albert R. Reduction of social anxiety through modification of self-reinforcement: An instigation therapy. Journal of Consulting and Clinical Psychology, 1968, 32, 565-574.
- Stuart, R. B. Behavioral control of overeating. Behavior Research and Therapy, 1967, 5, 357-365.
- Skinner, B. F. Science and human behavior. New York: Macmillan Co., 1953.
- Skinner, B. F. Beyond Freedom & Dignity. New York: Alfred A. Knopf, 1971.